THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A process for treating a stream of aqueous aerated oil sand slurry containing bitumen droplets and sand, comprising:

providing an elongate closed vessel forming a chamber having a circular cross-section and a longitudinal axis, said vessel having an inlet at one end and an outlet at its other end;

injecting the slurry stream through the inlet to cause the slurry to rotate as it advances longitudinally through the chamber, so that bitumen droplets move inwardly toward the chamber axis and are concentrated, thereby increasing the probability of bitumen droplet contact, coalescence and growth;

expelling the slurry stream through the vessel outlet; and

introducing the expelled slurry into the separator.